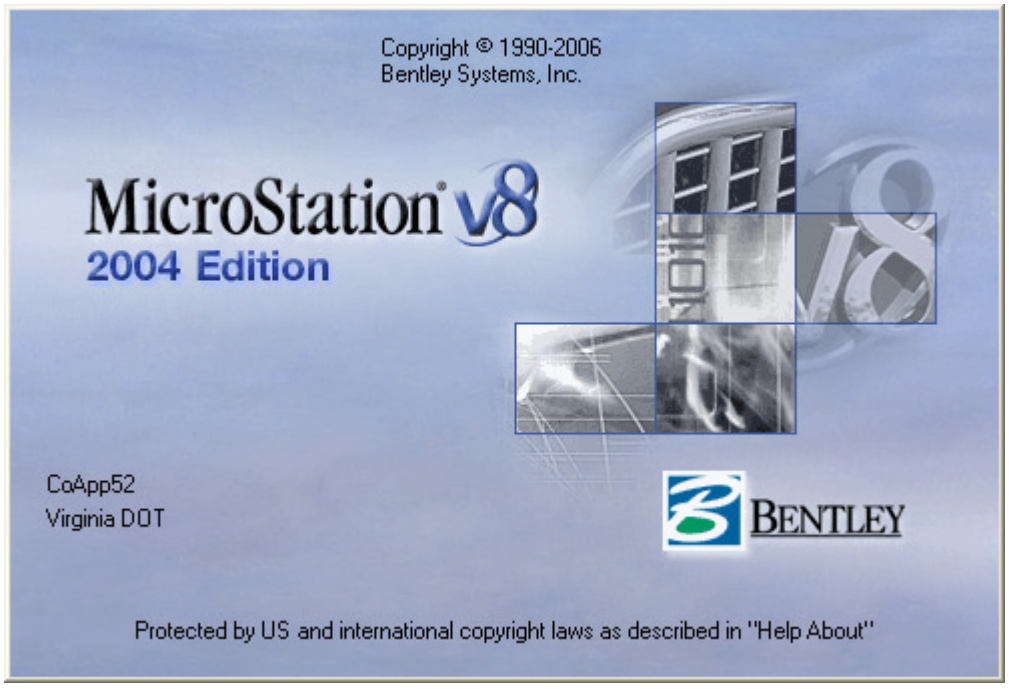
Creating SWPPP Map & Basin Info Sheets using TerrainPro USGS Quad Maps & Microstation V8



jtd 6/24/09

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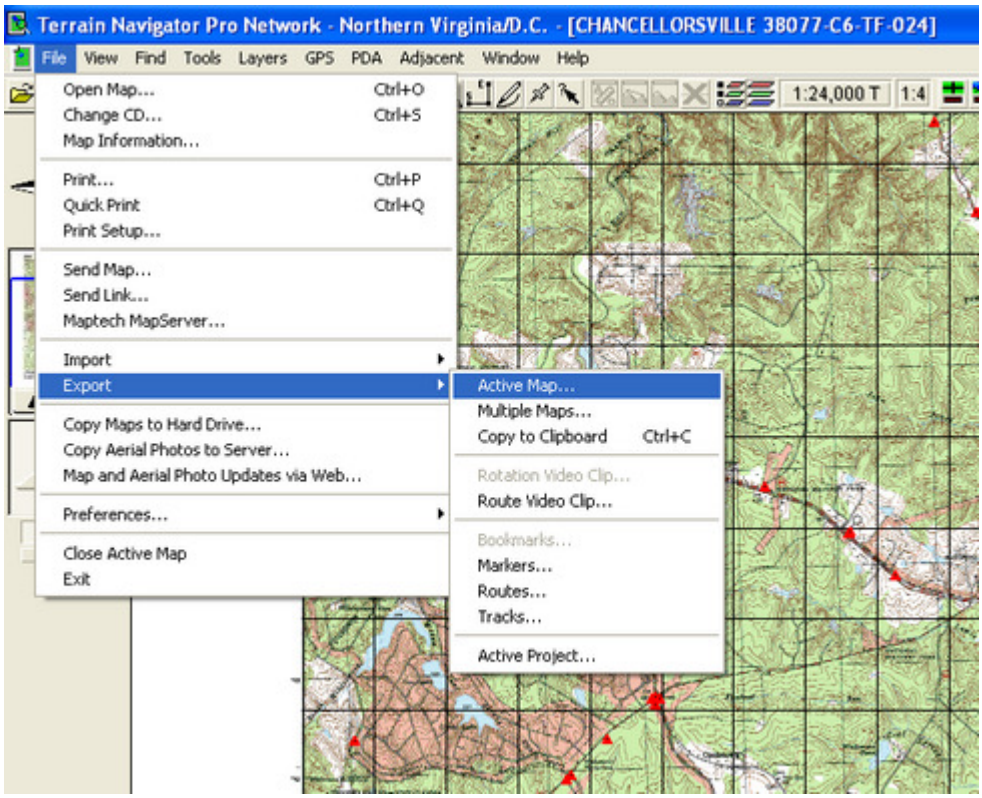
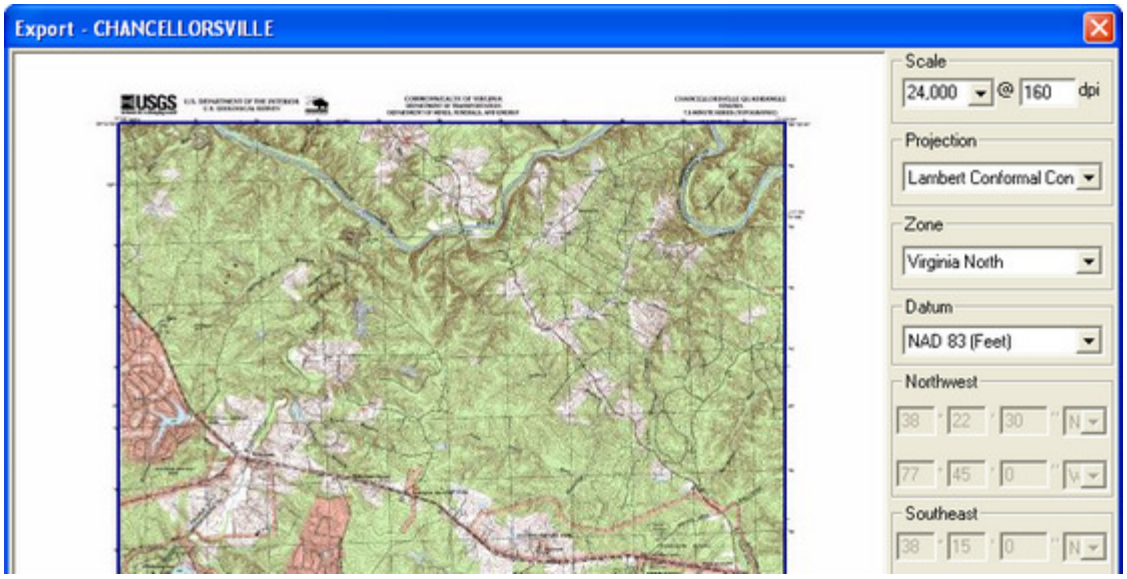
I. Exporting the Image from TerrainPro:

1) Start the TerrainPro software and open the quadrangle map of interest.
2) From the main menu bar, choose ***File***, ***Export*** and ***Active Map***.



The **Export palette** will open up, and you will be presented with an assortment of options for export.

The 1st series of options to set for the image will be the ***Scale***, ***Projection***, ***Zone*** and ***Datum***.



3) The ***Scale*** used to provide the most detailed map is 24,000. The DPI or resolution is set standard at 160 DPI; this is the optimal setting for the software.

4) For the ***Projection***, choose either Lambert Conformal Conic or State Plane.

5) For the ***Zone***, choose either Virginia North or Virginia South.

6) Next when setting the ***Datum***, you should first determine if the Microstation survey was performed using either Metric or Imperial units. If the survey is in Imperial units, select **NAD 83 (Feet)**. If the survey is in Metric units, select **NAD 83 (Meters)**.

The 2nd series of options to set for the image will be the ***NGS Data Type*** and the Export Options for ***Quality***, ***Clipping***, ***Area*** and ***Mask***.

7) For the ***NGS Data Type***, select **No NGS Export**.

The Export Options for the map should be set as follows:

8) ***Quality*** is normally set as **Medium**. You may select **High**, but it will increase the time required for export.

9) ***Clipping*** should be set as **4-point**.

10) The ***Area*** option consists of the following choices:

    a) **Entire Map** will provide an image including the white border and the map legend and information.

    b) **No Collar** will provide an image of just the map area excluding any of the border.

    c) **User Defined** will provide a custom image based on an area defined by the user.

Normally, I choose **Entire Map**, that way I can use the map scale as a check to insure that the map has been exported into Microstation at the correct scale.

11) When a map is reprojected, the image is shifted. In order to maintain rectangular dimensions, non-map data (for example, portions of the white map collar) may be included along the edges or corners of the exported image. The ***Mask*** option controls how this non-map data is replaced and provides the following options:

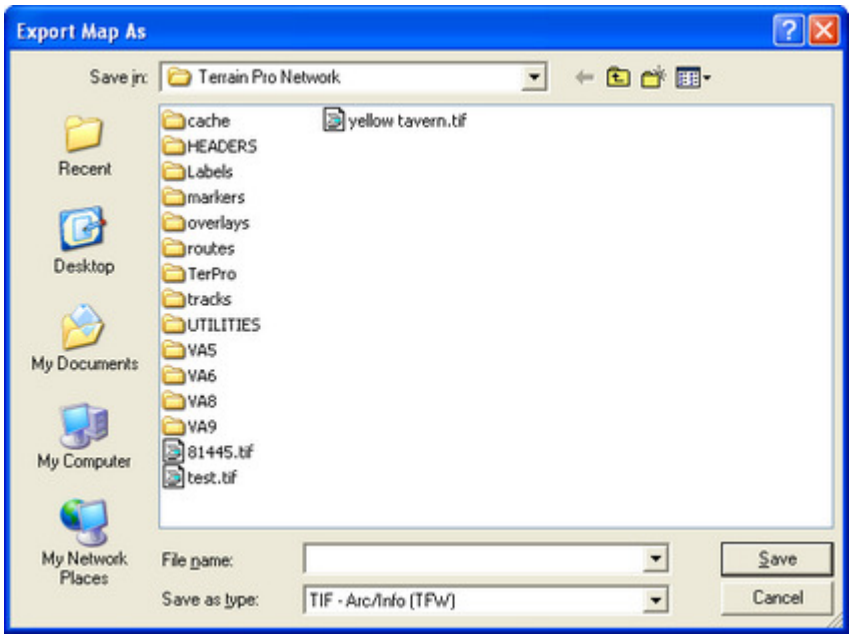
    a) **None**: If you do not require masking, simply choose **None**.

    b) **Color**: This will replace non-map areas with a magenta color. This color was selected because it is not used in any USGS topographic map, and therefore may safely be deleted in imaging programs without damaging the map image.

c) **Adjacent Map**: Areas not occupied by the selected map image will be filled with map data from the adjacent quad(s).

Normally, I choose **None** for this option as a personal preference. However, if my area of interest includes more than one map, I would select the **Adjacent Map** option.

12) The final step in exporting the image is to hit the **OK** button. In doing so, the following window will appear.

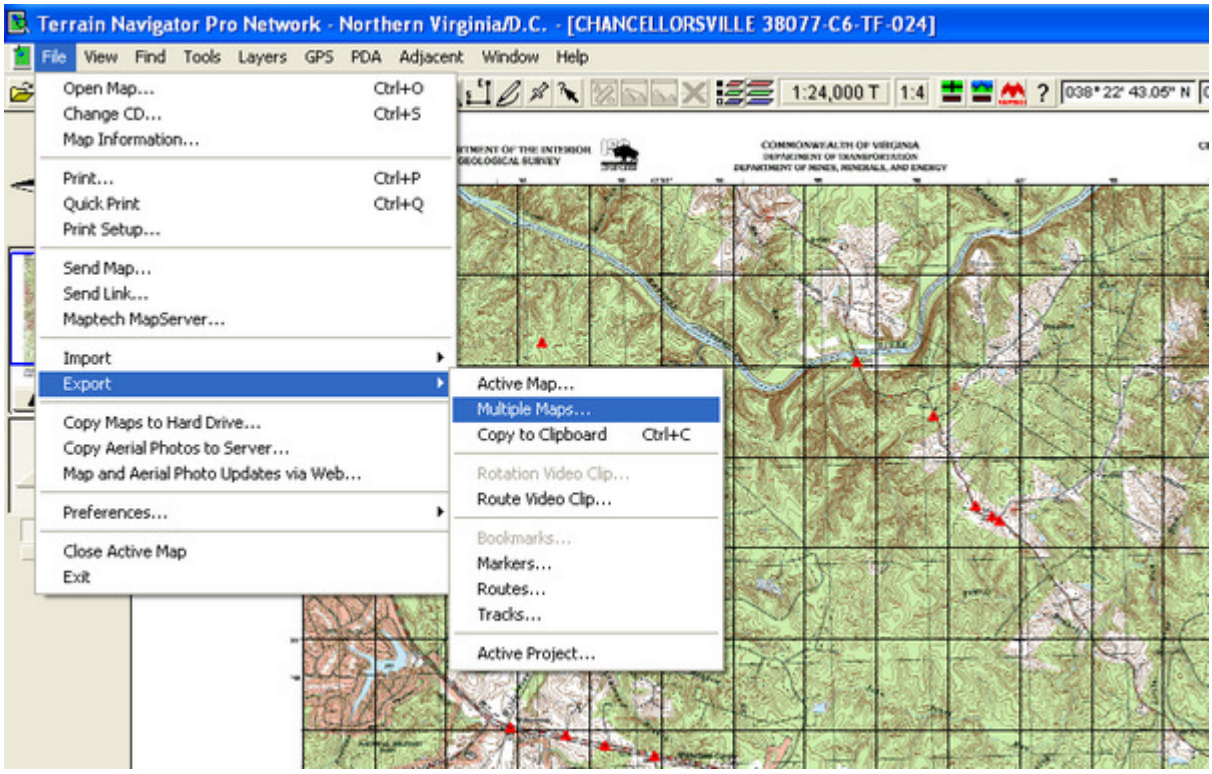


Provide a name and location for the file. I recommend choosing your local hard drive for the file destination, for the time being. (Later the file can be uploaded to Falcon DMS) The File Type should be set to **TIF-Arc/Info (TFW)**. Hit the Save button. This process will create two (2) files: a ***.tif** file and a ***.tfw** file. Do not delete the file with tfw extension, as this file provides information to Microstation dictating pixel size and the origin of the image.

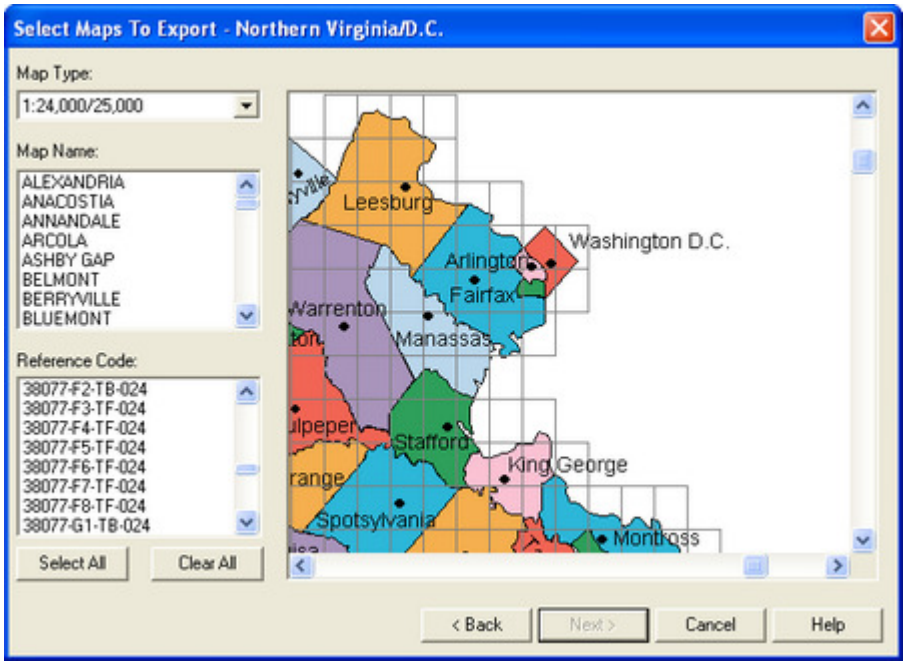
II. Exporting Multiple Maps at the Same Time (optional):

In addition to single-map export, TerrainPro also provides multiple-map export, which lets you apply the same settings to multiple maps and export them all with a single command. The process is very similar to that of exporting a single map as outlined previously.

1) From the main menu bar, choose ***File***, ***Export*** and M***ultiple Maps***.

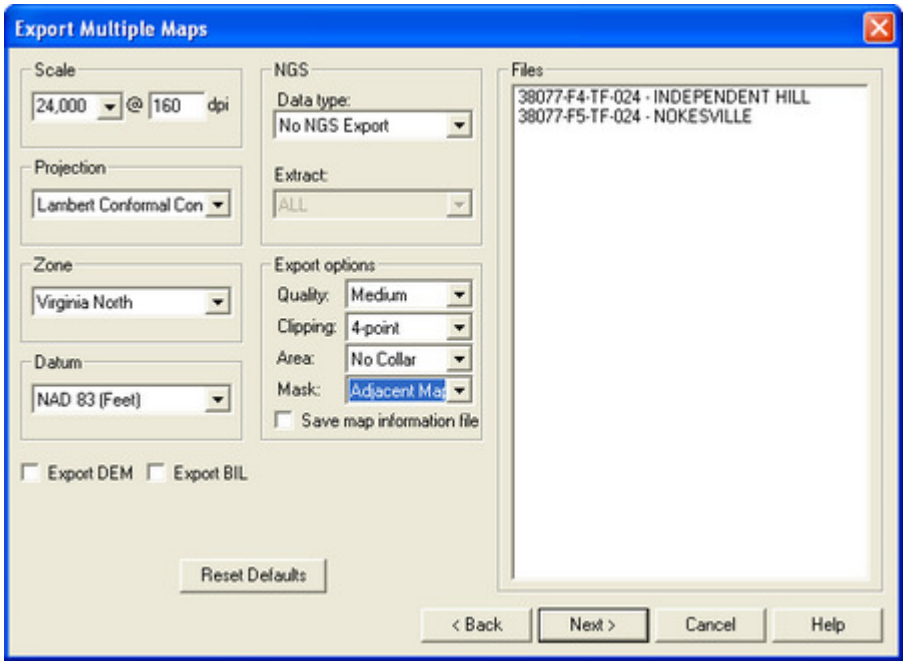


This opens the **Map Selection window** shown below; whereby you may select the maps you wish to export by clicking on the state overview map grid, or by highlighting the map titles in either the **Map Name** or **Reference Code** list. You can select multiple maps by clicking and dragging the cursor in the map selection grid, or by using the Shift and Control keys to select map titles in either list.



2) Select the desired maps, and hit the **Next** button.

This opens the **Export Multiple Maps window** shown below.



3) From this point, the process is virtually identical to that of **I. <u>Exporting the Image from TerrainPro</u>**, starting at step **3)** ***Scale Choice*** and progressing through step **11)** ***Mask Option***.

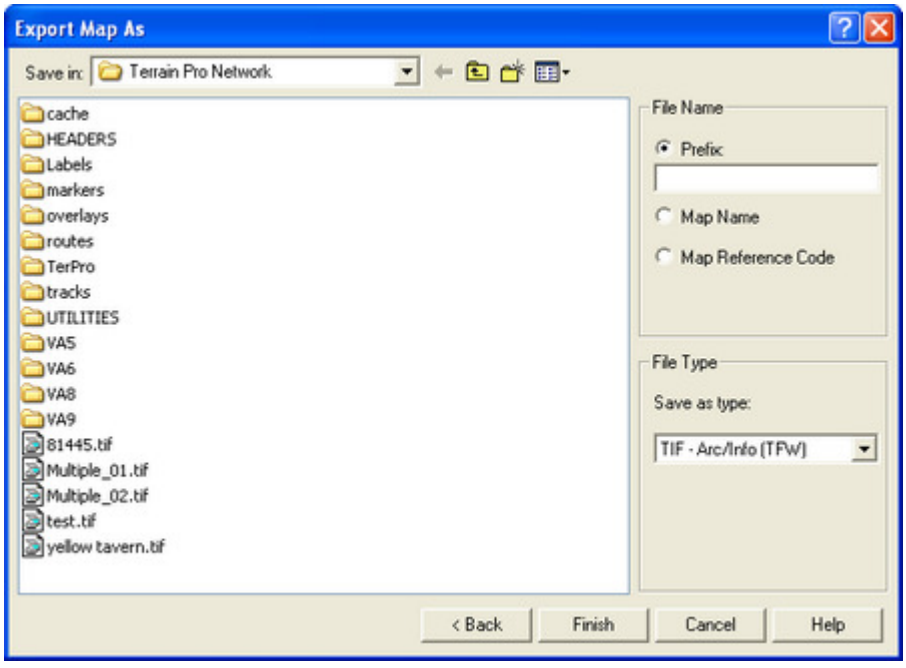
4) Once you have selected choices for all of the Export Options and hit the **Next** button, the **Export Map As window** shown below will appear.

5) **File Name:** You have three options for naming the files:

   a) Assign a prefix to use for each file name

   b) Use the map name for the corresponding exported file

   c) Use the map's reference code for the file name



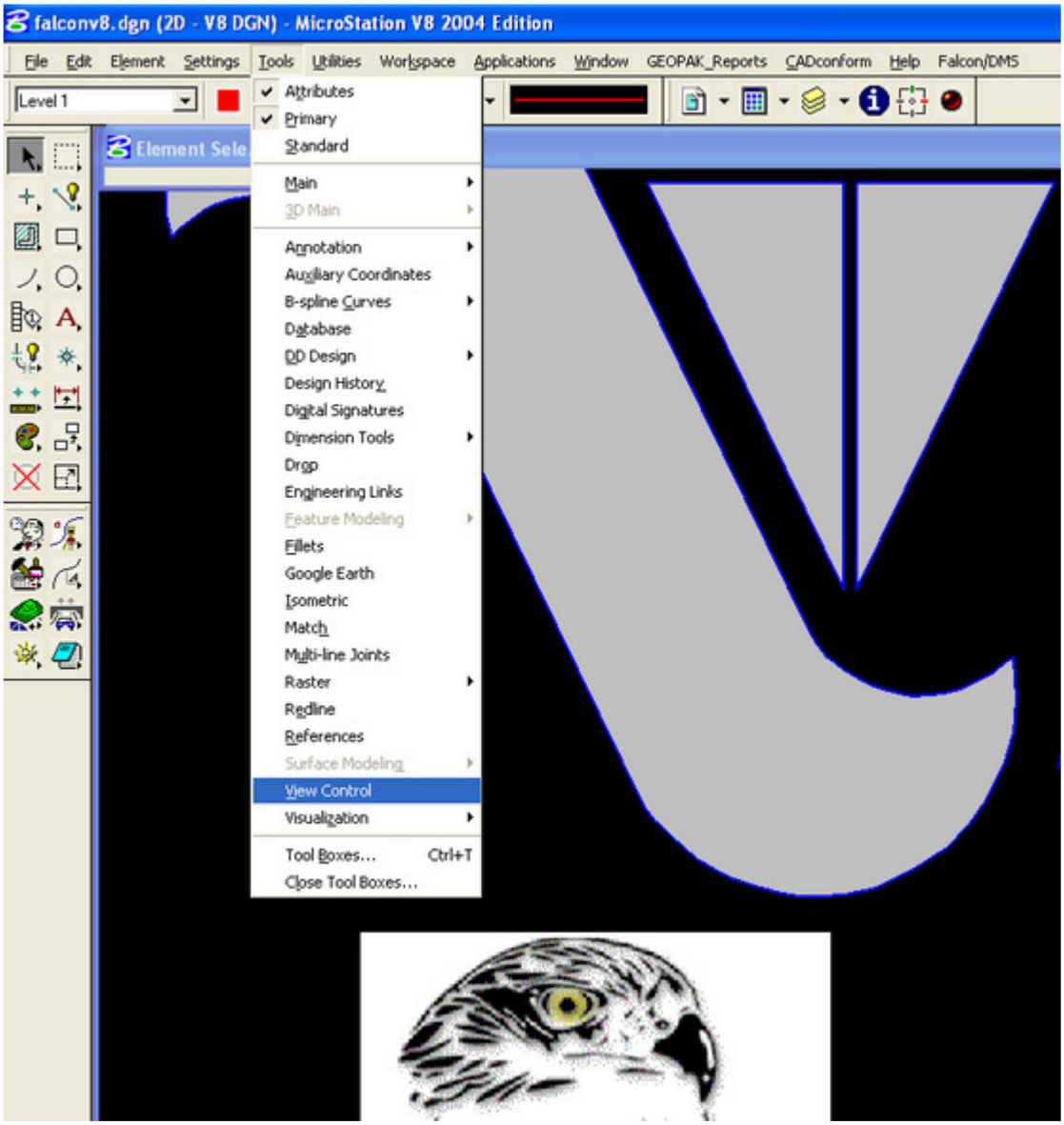
6) **File Type**: As before, the File Type should be set to **TIF-Arc/Info (TFW)**. Hit the **Finish** button.

III. Importing the Image into Microstation:

1) Open the appropriate version of Microstation V8, ***Imperial*** or ***Metric***, based on the units used to perform the project survey.

2) Either open an existing file or create a new file in which the **SWPPP Location Map & BMP Info Sheet** (this sheet is available as a cell) will be placed.

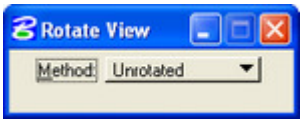
3) We must determine if the view in Microstation is rotated, and if so, unrotate it. This can be achieved by calling-up the **View Control tool palette.** From the main menu bar, choose ***Tools***, and ***View Control***.



This will open up the **View Control tool palette**, as shown below.

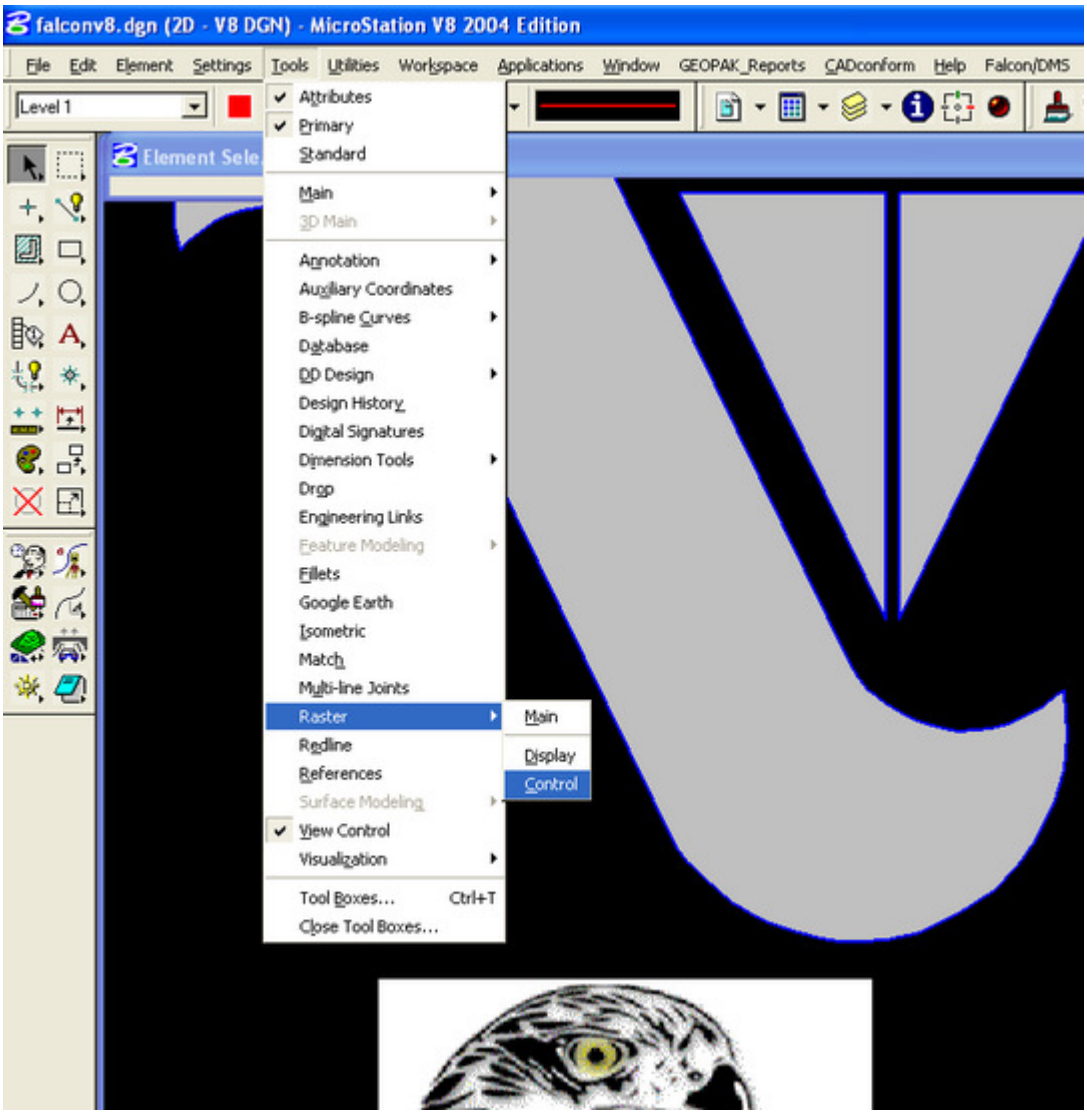
4) Select the **Rotate View button** (6th from the left).

The **Rotate View tool** will appear



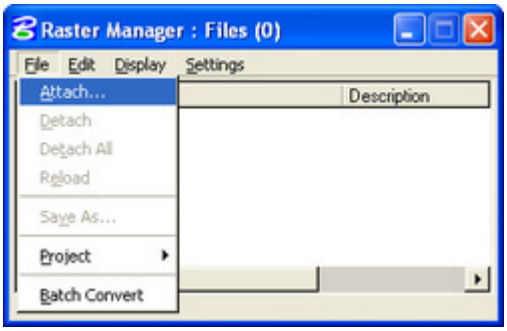
5) Change the ***Method*** to **Unrotated**.

6) From the main menu bar, choose ***Tools***, ***Raster***, and ***Control***.

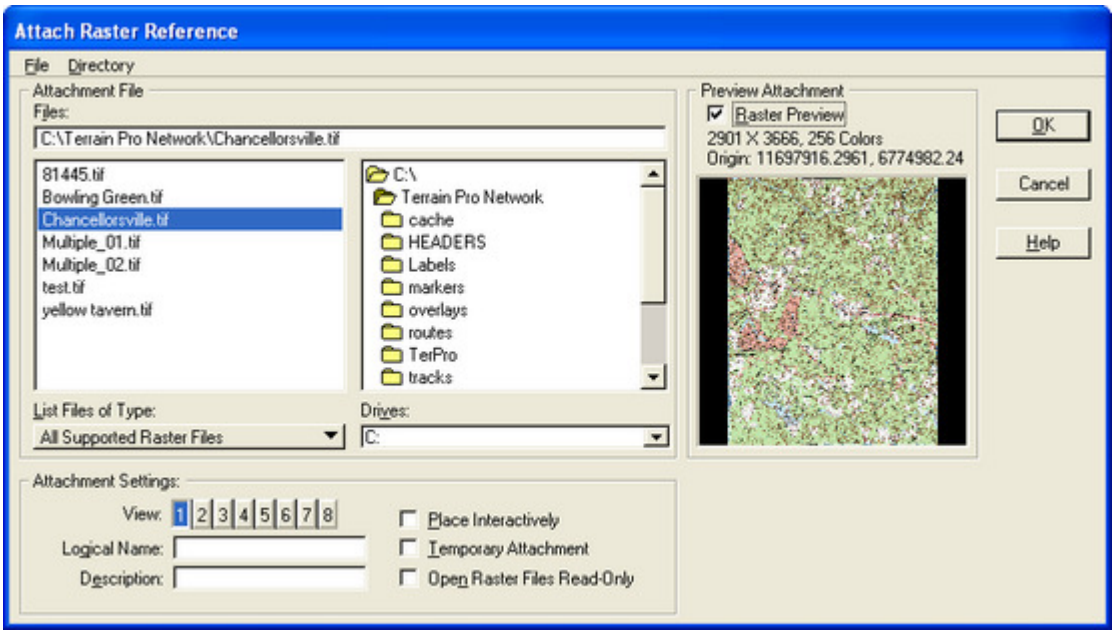


7) The **Raster Control tool palette** will appear, select the **Raster Manager button** (1st button on the left). The **Raster Manager Dialog Box** will appear.

8) From the Raster Manager Dialog Box menu bar, choose File and Attach.



This will open up the **Attach Raster Reference window**, as shown below.



9) Use controls in the **Attach Raster Reference window** to select the raster image file that you wish to attach. Under the **Attachment File section,** use the controls to navigate to the directory location were the *.tif file was previously saved in **I. <u>Exporting the Image from TerrainPro</u>**. Select the appropriate *.tif file that you wish to attach. Under the **Preview Attachment section**, you may turn on ***Raster Preview*** (Optional), to preview the file being attached. Under the **Attachment Settings section:**

   a) Turn-off all ***Views*** except for #1

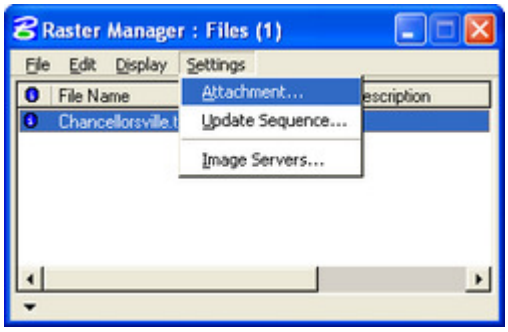
   b) Enter a ***Logical Name*** and ***Description*** (Optional)

   c) Ensure that ***Place Interactively*** and ***Temporary Attachment*** are **Unselected**

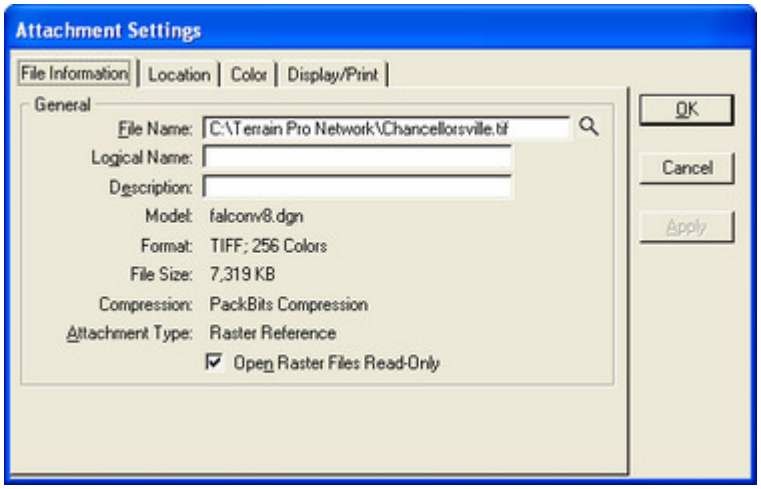
   d) Ensure that ***Open Raster File Read-Only*** is **Unselected** (this will allow the map to be move later, if needed)

Finally, hit the **OK** button.

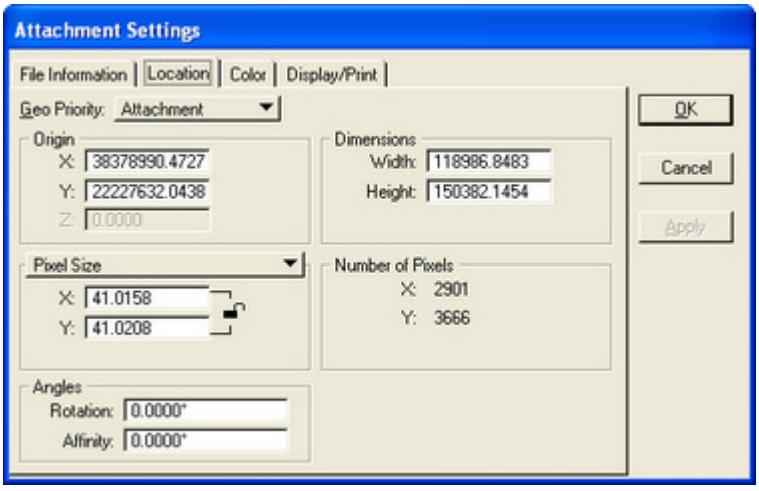
10) From the **Raster Manager Dialog Box** menu bar chose ***Settings***, and then ***Attachment***.



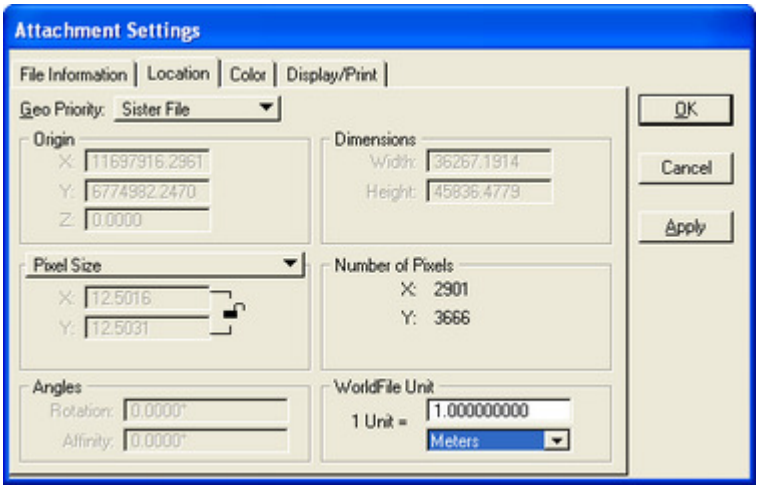
This will open the **Attachment Settings window,** as shown below. Generally, the default tab will be the **File Information tab**.



11) On the **Attachment Settings window**, select the **Location tab**.



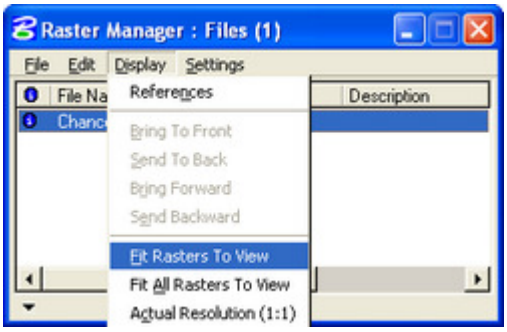
12) In the **Location tab**, change the *Geo Priority* setting to ***Sister File***. Then hit the **Apply** button.



Microstation automatic defaults to ***Meters*** as the **WorldFile Unit**.

13) Select the appropriate option for the **WorldFile Unit**, which corresponds with the unit of measure that was utilized for the Microstation survey. Chose between either ***Meters*** or ***Feet***. Hit the **Apply** button.

14) If you cannot see the map image in the view window, then from the **Raster Manager Dialog Box** menu bar chose ***Display***, and then ***Fit Rasters to View***. Then click on the screen. This should bring the map image into full view in the Microstation view window.



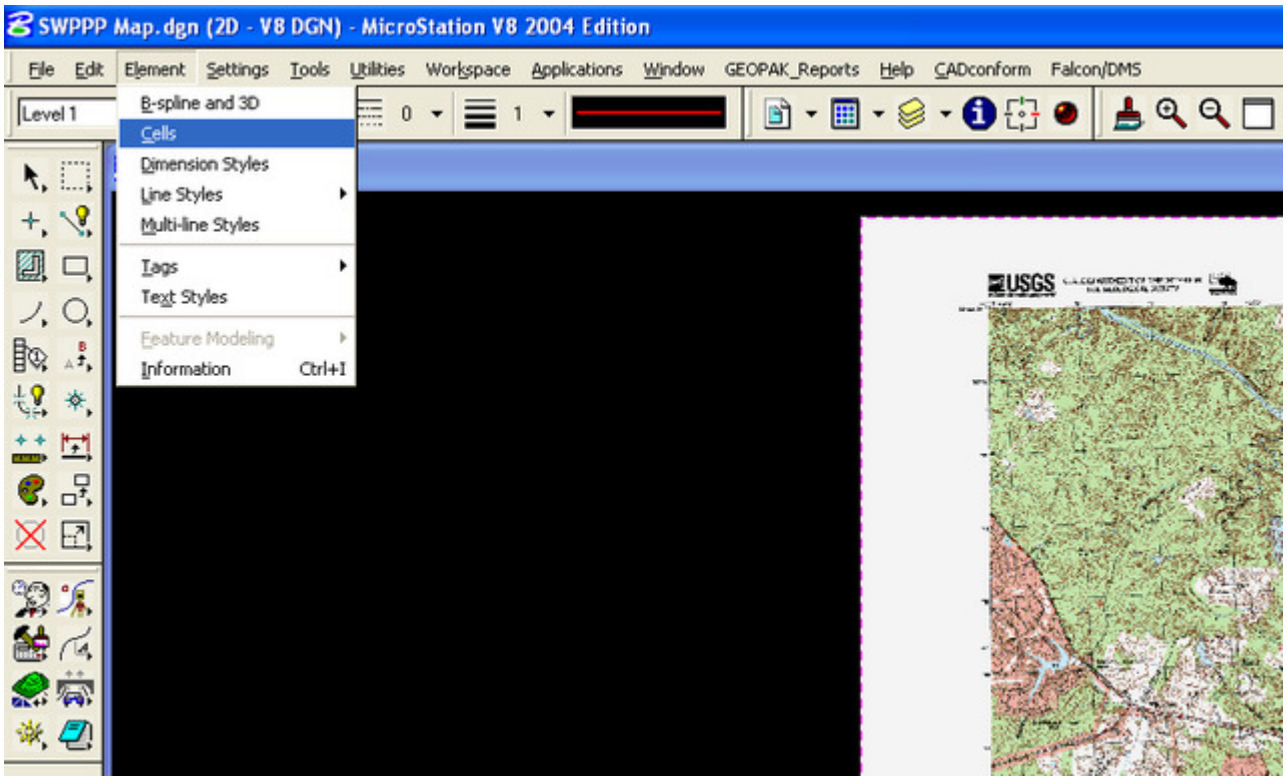
These instructions will import the USGS Quadrangle Map into Microstation at a true 1:1 scale. However, that does not guarantee that the map will coincide (with respect to horizontal control) with your referenced survey or design files. In fact, it would be miraculous if they did. This is due to the fact that a prescribed number of units are added to the Northing and Easting coordinates of the origin of the Microstation survey file. This moves the survey file and everything referenced to it (design, etc.) away from their true coordinates; and consequently our newly imported Quadrangle Map. Fortunately, this is **not** a requirement to produce the **SWPPP Location Map & BMP Info Sheet** (3rd SWPPP Plan Sheet).

However, should you desire to utilize the Quadrangle Map for a purpose such as defining project drainage areas; you must go back to **Step 12)** of **III. Importing the Image into Microstation** and change the *Geo Priority* setting to **Attachment** and then hit the **Apply** button. Now the raster image (quadrangle map) can be moved and/or rotated, as needed, to match the survey/design. The pixel size (scale) of the file should not be changed.

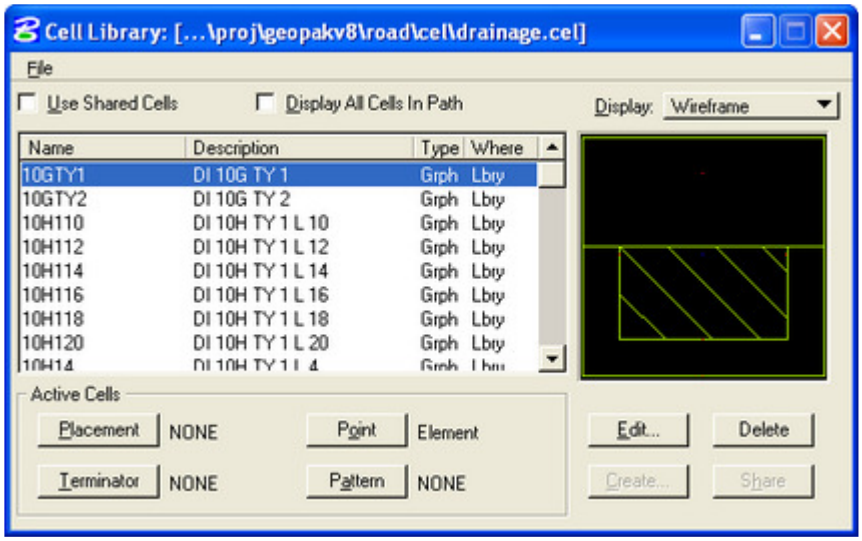
IV. Creating the SWPPP Map & BMP Info Sheet (3rd SWPPP Sheet):

At this point, you should have your Microstation file open with the raster image (quadrangle map) in full view on the screen.

1) From the Microstation main menu bar, choose ***Element*** and then ***Cells***.

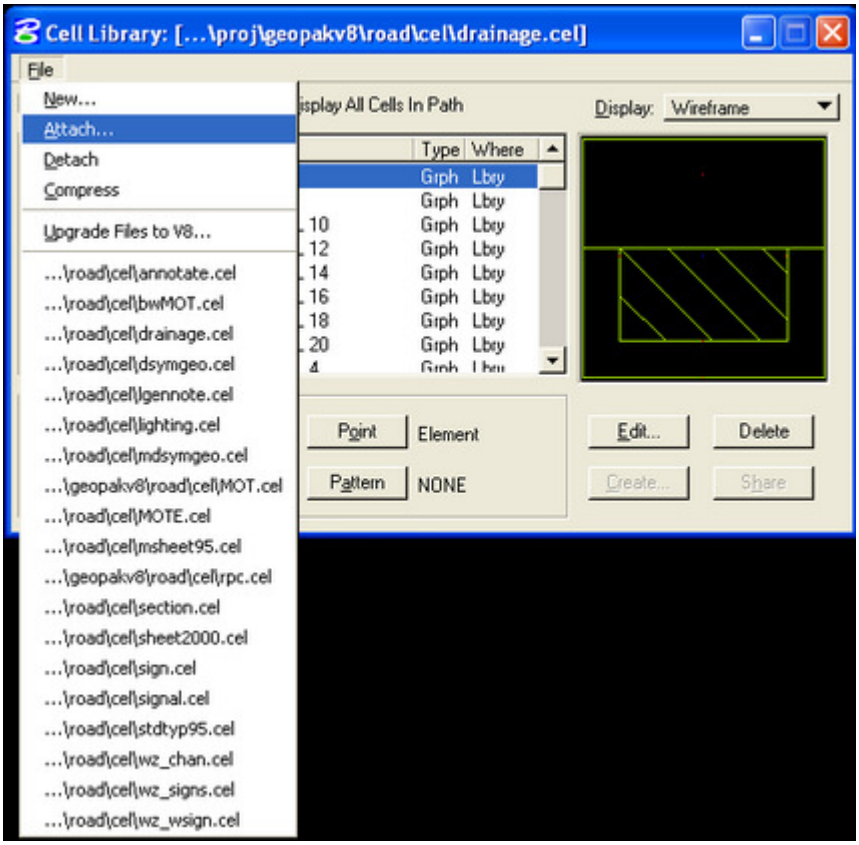


This will open the **Cell Selection window,** as shown below.

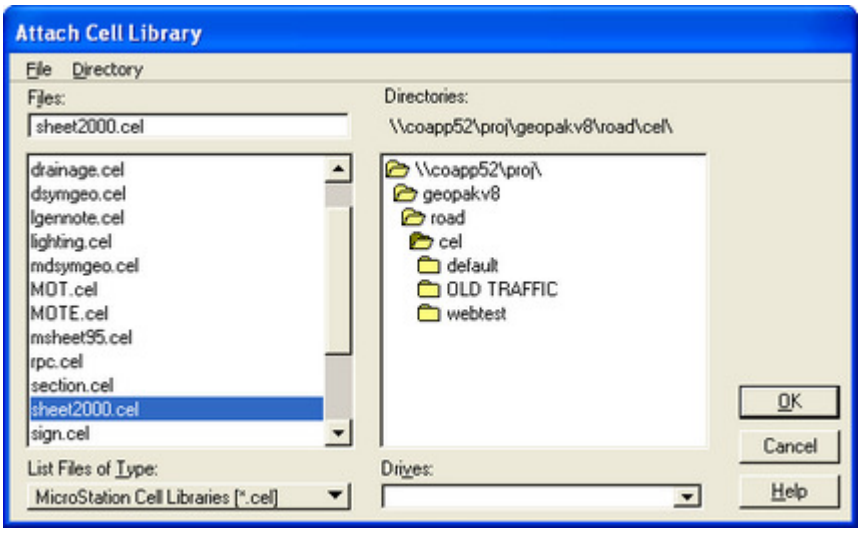


In order to select the appropriate Microstation cell for the **SWPPP Map & Basin Info Sheet**, we must first attach the correct **Cell Library**.

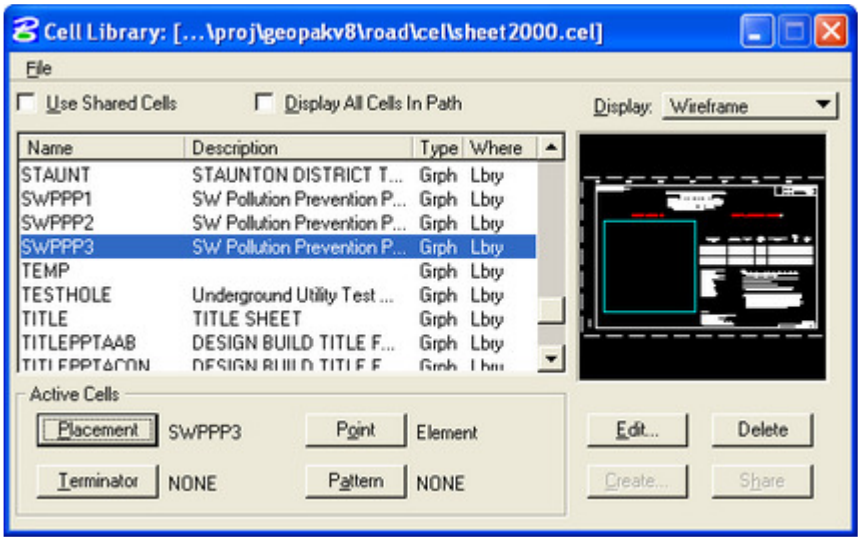
2) On the **Cell Selection window**, select ***File*** and then ***Attach***.



This will open the **Attach Cell Library window**, as shown below. The window should open to the appropriate directory containing all of the standard VDOT cell libraries, by default.

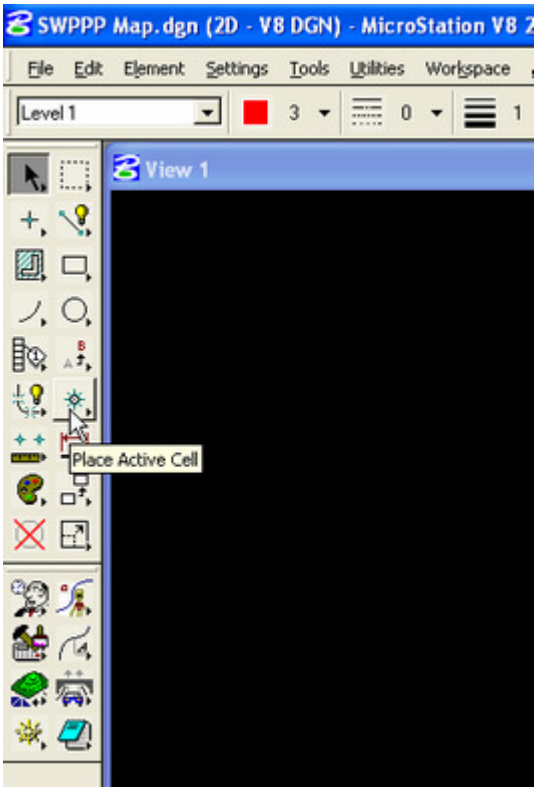


3) Select the ***sheet2000.cel*** cell library and hit the **OK** button. The **Cell Selection window** will reopen, as shown below.



4) Scroll down through the cell choices until cell **SWPPP3** is visible. Highlight the **SWPPP3** cell by clicking on it with the mouse pointer. Then, click on the **Placement** button to make it the active cell for placement. You may now close the **Cell Selection window**.

5) From the Microstation main tool palette, click on the **Place Active Cell** button, as shown below.

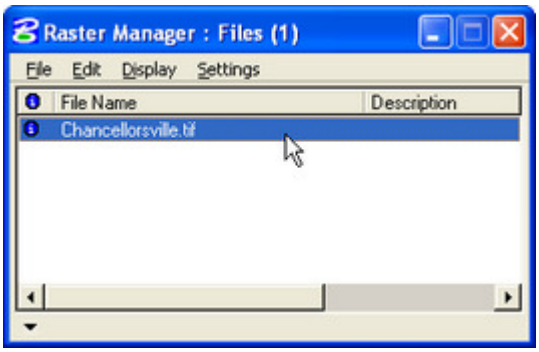


The **SWPPP3 Sheet Cell** is now active and ready to be placed on top of the raster image (quadrangle map). This cell should be brought in and placed at a Scale of 1.0. See **Fig. 1** in the **Appendix** for a diagram of the **SWPPP3 Sheet Cell**.

6) Use your mouse to position the cell, such that the center of the **red box** is generally at or near the project location on the quadrangle map.

Now we are ready to clip the raster image (quadrangle map) to the confines of the **red box**.

7) If the **Raster Manager** tool button is not already a part of the primary tool palette on your Microstation set-up, then go back and follow **Steps 6)** and **7)** of **III. Importing the Image in Microstation** to bring up the **Raster Manager Dialog Box** as shown below.



8) From the **Raster Manger Dialog Box** menu bar, select ***Edit*** and then ***Clip***.

9) Use your mouse to *"fence"* the **red box** in the SWPPP3 Sheet Cell. Then data point any where on the screen. You should now have your finished product on the screen. You may also wish to add some text labeling, similar to that on a roadway project *Location Map*, that indicates the approximate limits of the project. See **Fig. 2** in the **Appendix** for a diagram of a **Sample SWPPP3 Map & Basin Info Sheet.**

V. Notes on Plotting & Uploading of Files to Falcon DMS

- In order for the raster image (quadrangle map or clipped portion thereof) to properly reference to the Microstation design file that contains the **SWPPP3 Sheet Cell**, both the *.tif and *.tfw files will need to be uploaded to Falcon DMS. The *.tfw file should be uploaded as a text (*.txt) format document, although the filename does not actually change. Refer back to the end of **I. Exporting the Image from TerrainPro** for more information on these files.

- When using the PRF Generator in Quorum Plotting, the *"fenced"* **SWPPP3 Sheet Cell** should be plotted at **800 Scale** in order to produce a standard **35"x 23"** plan sheet.

APPENDIX

Figure 1

OGN $REF001 $REF002 $REF003 $REF004 $REF005 $REF006
$OGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

PROJECT MANAGER<Project Mgr. Name (000) 000-0000 (District)>
SURVEYED BY <Surveyor Name (000) 000-0000 (District)>
DESIGN SUPERVISED BY <Supervisor Name (000) 000-0000 (District)>
DESIGNED BY <Designer Name (000) 000-0000 (District)>

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	00	0000-000-000, RW-000 C-000	0

STORMWATER POLLUTION PREVENTION PLAN (SWPPP)
GENERAL INFORMATION SHEET

The SWPPP General Information sheets are to be completed and included in the construction plan set (or other such documents) for land disturbance activities that disturb an area equal to or greater than 10,000 square feet, or equal to or greater than 2,500 square feet in the area defined as Tidewater, Virginia in the Virginia Chesapeake Bay Preservation Act.

※ Denotes information that is to be provided/completed by the contractor or the VDOT RLD, as appropriate.

SECTION V - LOCATION MAP

SECTION VI - PERMANENT BMP INFORMATION △

Permanent BMP Type (See Table 1) (1)	Regional BMP Y(Yes) or N (No)	County/City (1)	State Hydrologic Unit Code (1)	BMP Receiving Stream Name (1) (2)	Acres Treated per BMP (3)	※ In Service Date (4)

Table 1: Permanent BMP Types
Bio-retention Basin
Bio-retention Filter
Constructed Stormwater Wetlands
Extended Detention Basin
Extended Detention Basin-Enhanced
Grassed Swale
Infiltration Basin
Infiltration Trench
Manufactured BMP's
Retention Basin I
Retention Basin II
Retention Basin III
Sand Filter
Vegetated Filter Strip
Other (List type) (5)

Notes:
(1) Where stormwater management requirements are being met by a Regional BMP, information listed is to be for the Regional BMP.

(2) For streams with no names, list "Unnamed Tributary to (closest stream name)".

(3) Show acres to the nearest one tenth.

(4) Date placed into service as a permanent BMP.

(5) Includes agreements with off-site BMP owners or payments into a DCR approved County/City Watershed Stormwater Management Plan (fund).

△ The information shown in the BMP table is based on the proposed pre-construction SWM Plan. Any changes to the proposed SWM Plan required during the construction phase of the project shall be coordinated by the VDOT RLD with the appropriate VDOT District Hydraulics Engineer. The RLD is to have the information shown in the BMP table revised to reflect any authorized changes to the proposed SWM Plan, add the "In Service Date" and include a copy of the BMP table with the LD-445D form when submitting for termination of coverage under the VSMP General Permit For The Discharge Of Stormwater From Construction Activities.

ACRONYMS

DCR - Department of Conservation and Recreation
ESC - Erosion and Sediment Control
R&B - Road and Bridge
RLD - Responsible Land Disturber
SWM - Stormwater Management
SWPPP - Stormwater Pollution Prevention Plan
VSMP - Virginia Stormwater Management Program

Sheet 3 of 3

	PROJECT	SHEET NO.
	0000-000-000	0

$TIMEST AMP$

c:\SWPPP Map.dgn 06/24/2009 11:59:55 AM

Figure 2

DGN $REF001 $REF002 $REF003 $REF004 $REF005 $REF006

$DGNLEV $LEV001 $LEV002 $LEV003 $LEV004 $LEV005 $LEV006

PROJECT MANAGER <Project Mgr. Name. (000) 000-0000 (District)>
SURVEYED BY <Surveyor Name. (000) 000-0000 (District)>
DESIGN SUPERVISED BY <Supervisor Name. (000) 000-0000 (District)>
DESIGNED BY <Designer Name. (000) 000-0000 (District)>

REVISED	STATE	STATE ROUTE	STATE PROJECT	SHEET NO.
	VA.	00	0000-000-000, RW-000 C-000	0

STORMWATER POLLUTION PREVENTION PLAN (SWPPP) GENERAL INFORMATION SHEET

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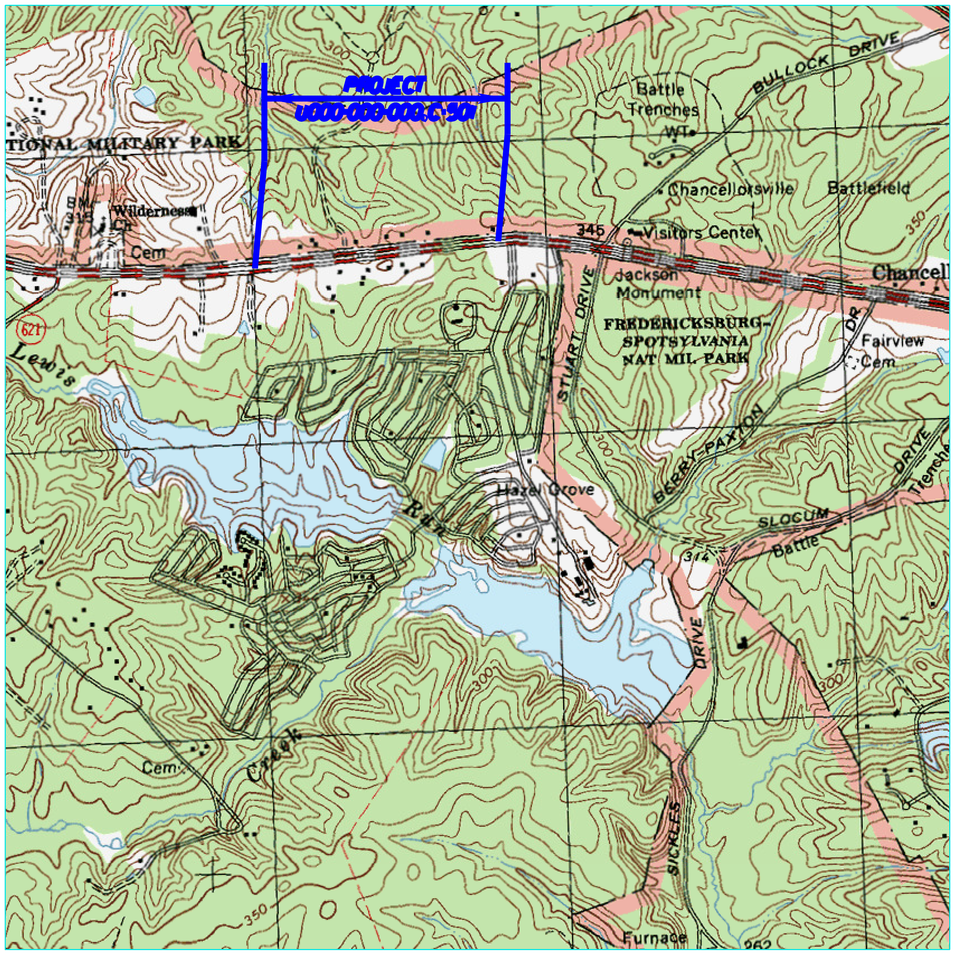
✖ Denotes information that is to be provided/completed by the contractor or the VDOT RLD, as appropriate.

SECTION V - LOCATION MAP



SECTION VI - PERMANENT BMP INFORMATION △

Permanent BMP Type (See Table 1) (1)	Regional BMP Y(Yes) or N (No)	County/City (1)	State Hydrologic Unit Code (1)	BMP Receiving Stream Name (1) (2)	Acres Treated per BMP (3)	✖ In Service Date (4)

Table 1: Permanent BMP Types
Bio-retention Basin
Bio-retention Filter
Constructed Stormwater Wetlands
Extended Detention Basin
Extended Detention Basin-Enhanced
Grassed Swale
Infiltration Basin
Infiltration Trench
Manufactured BMP's
Retention Basin I
Retention Basin II
Retention Basin III
Sand Filter
Vegetated Filter Strip
Other (List type) (5)

Notes:
(1) Where stormwater management requirements are being met by a Regional BMP, information listed is to be for the Regional BMP.

(2) For streams with no names, list "Unnamed Tributary to (closest stream name)".

(3) Show acres to the nearest one tenth.

(4) Date placed into service as a permanent BMP.

(5) Includes agreements with off-site BMP owners or payments into a DCR approved County/City Watershed Stormwater Management Plan (fund).

△ The information shown in the BMP table is based on the proposed pre-construction SWM Plan. Any changes to the proposed SWM Plan required during the construction phase of the project shall be coordinated by the VDOT RLD with the appropriate VDOT District Hydraulics Engineer. The RLD is to have the information shown in the BMP table revised to reflect any authorized changes to the proposed SWM Plan, add the "In Service Date" and include a copy of the BMP table with the LD-445D form when submitting for termination of coverage under the VSMP General Permit For The Discharge Of Stormwater From Construction Activities.

ACRONYMS

DCR - Department of Conservation and Recreation
ESC - Erosion and Sediment Control
R&B - Road and Bridge
RLD - Responsible Land Disturber
SWM - Stormwater Management
SWPPP - Stormwater Pollution Prevention Plan
VSMP - Virginia Stormwater Management Program

	PROJECT	SHEET NO.
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